

Teacher Gram

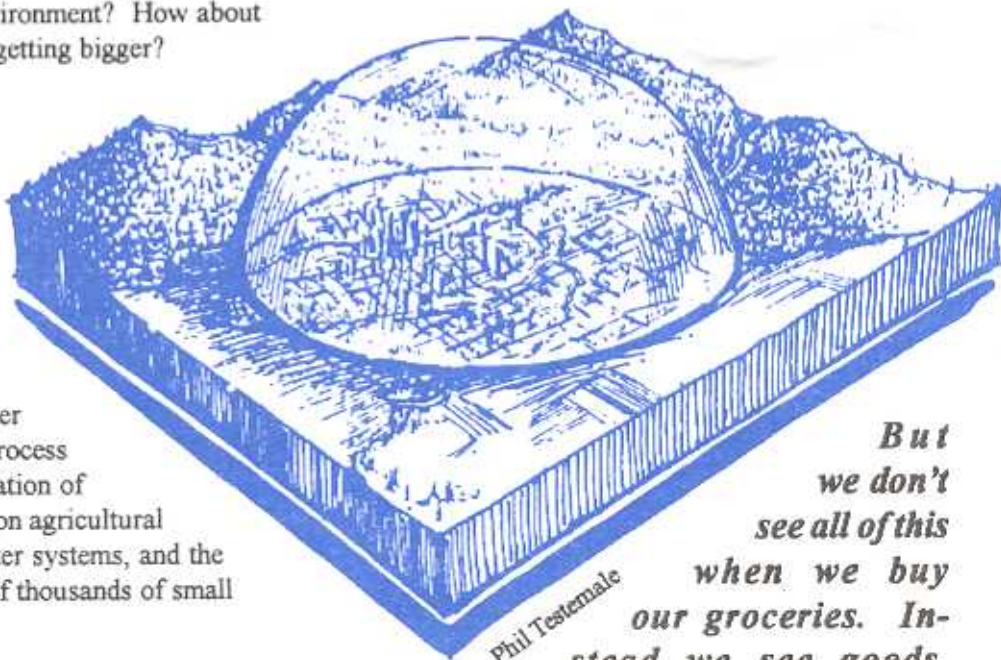
A Five Part Learning Resource for Secondary Schools

Sustainable Agriculture

Sustaining the Land, Sustaining the Farmer

Imagine for a moment that your city, town or community was completely covered by a giant glass dome, forming a tightly closed system, an urban or rural terrarium. How big would the dome have to be for its resources to provide for all the needs of its inhabitants? How big to clothe and shelter them? What about waste removal and sources of energy? How big to account for the health of the environment? How about food production? Is your dome getting bigger?

Clearly, the land needed to produce just food for the inhabitants of a city far surpasses the size of the city itself. Cities draw tremendously on the resources of distant places for their survival. Global food production and distribution systems supply this need, and in the process link humanity together like never before. Part of the process has been the near-global degradation of farm soils, urban encroachment on agricultural land, contamination of fresh water systems, and the annual impoverishment of tens of thousands of small scale farmers.



But we don't see all of this when we buy our groceries. Instead we see goods,

prices, and labels. How can this happen? Just who is minding the store? More important still, how can we reverse this trend?

Fortunately, the discussion has already started, and it is called **Sustainable Agriculture**. Sustainable Agriculture is an approach to food production and distribution which considers not only the health of the environment but also the economic survival of farmers, and the ability of all people to afford nutritious food. After all, access to adequate food is a basic human right.

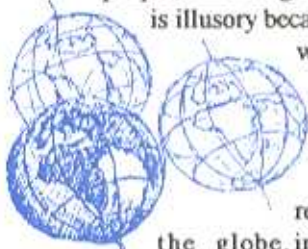
Sustainable Agriculture

Agriculture is sustainable when it is ecologically sound, economically viable, socially just, culturally appropriate and based on a holistic scientific approach.

*Sustainable Agricultural Treaty
of Non-Governmental Organizations, 1992*

Confronting the Illusion

In the so-called 'developed societies' of the West, there is an illusion of abundance, achieved at great cost to nature's ecosystems and to people inhabiting other parts of the globe. This kind of abundance is illusory because it's not sustainable in the real sense of the word. Modern conventional agriculture and present day society do not recognize or pay the true cost of this 'abundance'. If everyone on the earth were to enjoy the lifestyle of the average North American we would need the resources of another two planet earths! All over the globe, including British Columbia, concerned people (including farmers), organizations and government ministries are addressing the illusion of abundance. Sustainability is the key. The will to confront the illusion opens the door.



Sustainability

Sustainability means that each generation of humans passes on to the next generation resources (such as farmland and topsoil, fish and wildlife, forests and minerals, and natural landscapes) and environmental quality (such as pure water, clean air, healthy ecosystems and livable communities) that are undiminished and, as much as possible, enhanced so they can be maintained indefinitely from generation to generation.

British Columbia's Strategy for Sustainability, Report to the Legislative Assembly 1994-95

Teaching and Learning About the Environment and Sustainability

Environmental education is a way of understanding environments and how humans are a part of, and influence environments. It integrates concepts and principles of the sciences and social sciences such as ecology, biogeography, sociology, environmental chemistry, psychology, politics and economics. Sustainability is an important concept which forces us to look at the scale of present day economic activity within the environment. It explores the relationships between social, economic and environmental factors for the well-being of the human species. Thinking about sustainability forces us to examine the ability of the environment to continue to provide for all species, both today and in the future.

Environmental Concepts in the Classroom, A Guide for Teachers, Province of British Columbia, Ministry of Education, 1995.

About the

These units link the global to the local. Begin with the Teaching Guide then move to any of the other topics. Each unit, including the Teaching Guide, can be studied separately - together they provide a

Unit

Sustainable
Agriculture:
Teaching Guide

Sharing the Land,
Protecting the
Harvest

Food Security,
the Right to Eat

Soil,
the Biosphere's
Foundation

Water,
the Source
of Life

The Global
Consumer

Sustainable Agriculture Series

broad look at issues of sustainable agriculture, offering the class an excellent opportunity to integrate environmental and sustainability themes into a variety of subject areas. The first two activities in the teaching guide give students an opportunity to address basic sustainability concepts through examining the concepts

of foundations of sustainability, and of appropriated carrying capacity. The third activity gives special consideration to farmers.

This chart below will help the teacher in lesson and unit planning. Bolded words in the text are found in the glossary at the end of each unit.

Main Ideas

- The Earth's resources are limited, yet we continue to consume them at an increasing rate.
- Food production and distribution link people together from all over the planet in a complex economic and cultural web.
- Sustainable agriculture is an approach to food production and distribution which takes into account the social, economic and environmental costs of feeding people.
- The Land is a living body made up of whole ecosystems.
- Land Stewardship aims to strike a balance between human activity and the needs of other components of the ecosystem.
- Farmland protection is essential to building sustainable Agricultural systems.
- Every individual has a basic right to nutritious food (UN Declaration of Human Rights).
- Food Security, the long term access to nutritious food, is linked to social, economic, political and environmental systems.
- Sustainable Agriculture protects our ability to feed ourselves over the long term.
- The economic survival of small scale farmers is seriously threatened, yet it is key to food security.
- The soil is living.
- Soil degradation is a threat to food security.
- Soil conservation is a key feature of sustainable agriculture.
- Water is an essential element of life.
- Surface contamination and groundwater depletion threaten human and ecosystem health.
- Conservation farming, collaborative watershed management, and domestic care with pesticides all contribute to healthy water systems.
- Eating food links us to farmers and environments all over the world.
- Consumer food choices have social, economic and environmental impacts.
- Consumer food choices can have a positive effect on the health and nutrition of individuals and families,

Subject Links

- Renewable and non-renewable resources. (Geography 12)
- Management of resources, analysis and decision-making. (Geography 12)
- The Global Village. (Social Studies 11)
- Resource management and conservation, Urbanization. (Social Studies 11)
- People's interactions with the environment, Urbanization of agricultural land. (Geography 12)
- Global food production, Population and development. (Social Studies 11)
- Making informed decisions about food needs. (Home Economics 8-12)
- Renewable and non-renewable resources, Land use and ecosystem change. (Geography 12)
- Pollution. (Science 8-10)
- Water Use (Geography 12)
- Waste Water and Contaminants. (Science and Technology 11)
- Types and Impact of Water Pollution. (Science 10)
- Healthy Living: Environmental and social impacts of lifestyle, health practices and wise consumer choices. (Career and Personnel Planning 8-12)
- Making informed decisions to address food needs (Home Economics 8-12)

Activity

Three Foundations of Sustainability

There are many definitions and uses of the word sustainability. All stress the importance of long-term planning and of finding a balance between the health of the environment and the needs of society. This requires considering the needs of future generations and developing a better understanding of ecological systems. Much of the current debate is about defining this balance, and then agreeing on how to get there. The definition below comes from a 1994-95 Report to British Columbia's Legislative Assembly, titled *British Columbia's Strategy for Sustainability*.

"The long-term health of the resource economy can be maintained only through careful management of all components of the ecosystems – including soils, water and plant and animal species – that are important to the reproduction of renewable resources. The commitment and ability of society to protect our environment is strengthened when the economy is also strong. Finally, both economic prosperity and environmental well-being contribute to the quality of life of communities and the society as a whole. Social, economic and environmental objectives therefore depend on each other, and whatever is a threat to any one of these is a threat to all.



The Three Foundations of Sustainability

B.C.'s Strategy for Sustainability

Our knowledge of how to plan for sustainability has greatly increased, as has the agreement throughout society that it needs to be done. What is needed now is the determination to do it, and the humility to recognize that we still have much to learn and therefore must constantly adapt our activities based on new experiences and information."

1 **A** Threat to One is a Threat to All
Solving resource conflicts has often pitted economic, environmental and social values against each other. This creates an *us-them* approach which leads to lack of trust, built-in conflict, and no-win solutions. Logging in B.C. is a good example of this - environmentalists save a forest and loggers are put out of work. According to the Three Foundations of Sustainability above, social, economic and environmental objectives depend on each other and "*whatever is a threat to any one of these is a threat to all*".

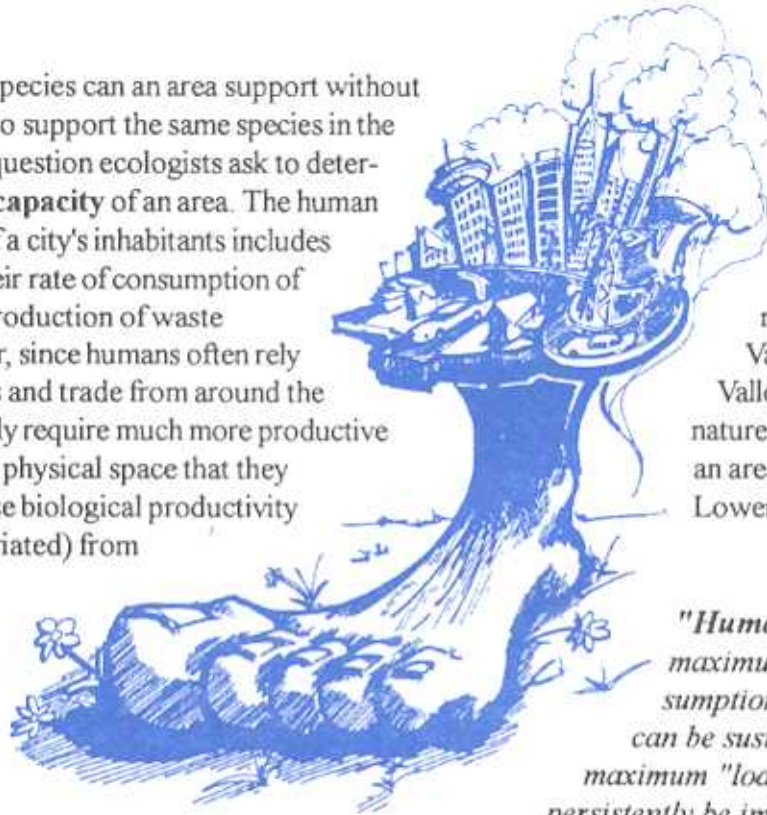
Your Task Form groups of 3 to 5 with each group representing one of the Three Foundations of Sustainability. The task of each group is to produce a set of 3 to 5 recommendations addressing food security and sustainability in British Columbia. Imagine that the recommendations will be used to guide government policy makers. Each recommendation should address your group's concerns, yet consider the needs of the other sectors. Refer to the points in the diagram above. Report back to the class.

2 **T**he Three Foundations of Sustainability says, "*and the humility to recognize that we still have much to learn...*" Why humility? How is this going to help us develop sustainable solutions? What has been society's attitude up to now?

Your Task Work in pairs. Look up 'humble' and 'humility' in a dictionary and discuss its meaning as it relates to sustainability planning. Each person write a one page letter to the editor of a newspaper arguing the value of humility in making decisions around sustainability issues (or any decisions for that matter, where differing values and opinions are expressed). Next, exchange letters with your partner and write a rebuttal to their argument. Be as critical as possible, but make sure your position is supported or believable. Finally, get together with another pair and discuss the exercise. What issues came up? What common perspectives or approaches were found; what different ones? Report back to the class.

Ecological Footprints and Appropriated Carrying Capacity

How many of one species can an area support without reducing its ability to support the same species in the future? That is the question ecologists ask to determine the **carrying capacity** of an area. The human carrying capacity of a city's inhabitants includes an accounting of their rate of consumption of resources, and of production of waste discharge. However, since humans often rely on consumer goods and trade from around the world, cities typically require much more productive land than the actual physical space that they occupy. In this case biological productivity is taken (or appropriated) from somewhere else, sometimes from land which belongs to others, such as farmland in Central America, and



sometimes from the global commons, such as the oceans. This appropriated carrying capacity is taken into account when an **ecological footprint** is measured. For example, the Vancouver-Lower Fraser Valley Region appropriates from nature the ecological production of an area 22 times larger than the Lower Fraser Valley itself.

"Human carrying capacity is the maximum rate of resource consumption and waste discharge that can be sustained indefinitely, or the maximum "load" that can safely and persistently be imposed on the environment." Ecological Footprints

Creating the Future

Imagine that the year is now 2021. Eighty percent of the food that you buy now travels an average of 100 kilometres, rather than the 1400 kilometres of 25 years ago. Also, the number of farm families has tripled, making farming one of the fastest growing industries in the province. The number of food banks in Canada has dwindled from 436 to 25.

Your Task Is this a possible future? What events could lead to this? In small groups make a chart like the one below to track possible events over the next 25 years. What changes will take place, what will reduce our ecological

footprints and take us closer to the path of agricultural sustainability? Start with 1996 and move through time as fast or slowly as you want. Use your imagination - remember, in the future just about anything is possible! After you have finished, compare your chart with other groups. How similar were your future visions, how different?

	Economic	Environmental	Social
↓			



What a Dilemma!

The Thompsons have been fruit farming for three generations in the Okanagan Valley in B.C. For the third time this year the bank has phoned to say that they are late on their loan payments. Crop value can't keep up with increasing input costs: fertilizer, pesticide, and equipment maintenance. Faced with losing the entire 200 acre farm, Mr. Thompson sells 100 acres to a golf course developer. Although they are unhappy about losing family land, the cash will allow them to continue farming.

Do you agree with Mr. Thompson's decision to sell the 50 acres? Yes, No, Depends.

Your Task

Form groups of three to five, so that each group has either all *yes* people or all *no* people. You may also want to have a *not sure* group. Each group chooses a record keeper, and decides who will report back to the class. They then make a list of reasons why you chose *yes* or *no*, or *not sure*. Compare with other groups. Have each reporter summarize. As a class, or again in small groups, discuss these questions:

- What are the key issues involved? ■ How diverse are the class's opinions on the issues?
- What options do the Thompsons have? ■ What are the likely consequences and risks of choosing the various options? ■ What information is needed before making any other choices?
- Role play a few solutions.

Farmer Subsidies for Soil Conservation in the Dominican Republic

This innovative Programme provides food subsidies for farmers who adopt soil conservation practices. It aims to eliminate a form of steep-sloped agriculture which produces sedimentation that obstructs and clogs up hydroelectric facilities. The Programme encourages the setting up of *conucos*, or shifting cultivation systems which emphasize agro-ecological practices and soil conservation to increase productivity and household food supplies. This also improves the regions ecologically and avoids the erosion-induced sedimentation that silts up the hydroelectric dams. Crop productivity at the new *conucos* tends to be satisfactory and stable.

Your Tasks

1. Subsidy Strategy Form small groups and on paper make two lists with the headings Possibilities and Difficulties. The *conucos* solution worked because it considered local circumstances - including the needs of farmers. How might the *conucos* food subsidy strategy be adapted to assist farmers in Canada? Use the case of Annie and Jacques in the Peace River Valley as an example (see front page of Soil Teachergram) or think of another example, maybe local. Keep track of your discussion with the Possibilities/Difficulties list. Share with the class.

2. Recommendations and Plan of Action One goal of the B.C. Ministry of Agriculture, Fisheries and Food is "To strengthen the physical and social infrastructure in order to increase the local capacity for sustaining regional economic opportunities and healthy rural families and communities." Draft a list of recommendations for the Ministry to help them plan for this goal. Keep in mind both the physical (water, roads, services) and social (standards of living, economic security) aspects of your recommendations. Next, develop a plan of action with a timeline, and list of human and monetary resources needed.



Recommended Resources

Apprenticeships

Willing Workers on Organic Farms

John Van Den Heuvel
RR2 S18 C9, Nelson, B.C. V1L 5P5
WWOOF consists of over 225 organic farms, from homesteads to ranches, across Canada where students over 16 can work and learn in exchange for room, and board. 100 of these farms are in B.C.

Stewards Of Irreplaceable Land (SOIL)

Kindwood Farm
499 Milstream Lake Road
RR#2, S.18 C.9
Nelson, B.C., V8X 3X2
tel:(604) 354-4417

Traveller Earth Repair Network (TERN)

Friends of the Trees Society
PO Box 4469 Bellingham, Washington
98227, USA, tel/fax:(360) 738-4972

Organisations

Farm Folk City Folk

Suite 208
2211 West 4th Avenue
Vancouver, B.C., V6K 4S2
tel: (604) 730-0450 fax (604) 730-0451

A not-for-profit networking and information resource for individuals and organisations concerned about food, agriculture and the environment.

Friends of the Trees Society

PO Box 4469 Bellingham, Washington
98227 USA
tel/fax: (360) 738-4972

Kootenay Permaculture Institute

Box 43, Winlaw, B.C., V0G 2J0
tel: (604)226-7302

The Land Institute

2440 E. Water Well Road.
Salina, KS, 67401 USA
Newsletter: The Land Report, \$25/year (US)

LifeCycles - see back cover

National Farmer's Union

Committee on Rural Alternatives (CORA)
Hart Haidn, Chair
Box 6872, Fort St. John, B.C., V1J 4J2
(604) 785-3300 fax (604) 785-4042
E-mail: hhaidn@sun.pris.bc.ca

National Farmer's Union

250C-2nd Ave S
Saskatoon, Saskatchewan, S7K 2M1
ph (604) 652-9465 fax (306) 664-6226
E-mail: farmers@eagle.whm.ca

North American Fruit Explorers (NAFEX)

Rt.1, Box 94
Chapin, Illinois, 62628 USA
Newsletter: Pomona, \$12/year (US)

OXFAM Canada

300-296 Albert Street
Ottawa, Ontario, K1P 6E6
tel: (613) 237-5236, fax (613) 237-0524
or: 2524 Cypress St.
Vancouver, B.C., V6J 3N2
or: 1921 Fernwood Avenue
Victoria, B.C., V8T 2Y6

Seeds of Diversity Canada

PO Box 36 Station Q
Toronto, Ontario, M4T 2L7

SIOPA - see back cover

Turtle Island Earth Stewards (TIES)

Box 3308
Salmon Arm, B.C., V1E 4S1

United Nations Environment Programme (UNEP)

P.O. Box 30552
Nairobi, Kenya

United Nations Development Programme (UNDP)

1 U.N. Plaza
New York, New York, 10017, USA

Victoria Compost Education Centre

Victoria, Chambers Street
ph (604) 386-9676

VIDEA - see back cover

World Food Program (WFP)

426 Via Cristoforo Colombo
00145 Rome, Italy
The WFP is a UN Food and Agriculture Organisation initiative.

Books

Grow B.C., A Teacher's Handbook on B.C.'s Agriculture, Fish and Food Business. British Columbia Agriculture In the Classroom Foundation
c/o 4th Floor, 808 Douglas Street
Victoria, B.C., V8W 2Z7
phone 356-1688 or 356-1635

Our Ecological Footprint

Reducing Human Impact on the Earth
Mathis Wackernagel and William Rees
New Society Publishers. This book cuts through the talk about sustainability and introduces a revolutionary new way to determine humanity's impact on the earth. To order this and other books call 1-800-387-0141

Environmental Concepts in the Classroom: A Guide for Teachers
Province of British Columbia Ministry of Education, 1995

Designed to assist teachers of all subjects and grades to integrate environmental concepts into their daily lesson plan.

Backyard Biodiversity and Beyond...

A Handbook for Students and Teachers
Province of British Columbia Ministry of Environment Lands and Parks Ministry of Forests, 1994

Words into Action

OXFAM, 1995
Available from OXFAM-Canada
tel: (613) 237-5236, fax (613) 237-0524

World Resources: A Guide to the Global Environment 1994-95

World Resources Institute
1709 New York Avenue
Washington, D.C., 2006 USA

Journals

The Moment (No.23, 1995)

The Jesuit Centre for Social Faith and Justice
tel: (416) 469-3579 fax: (416) 469-3572
A comprehensive look at our food systems and how they affect our prospects for food security

Green Teacher

tel: (416) 920-1244 fax: (416) 925-3474
A non-profit publication written by and for educators, to enhance environmental and global education across the curriculum and at all grade levels.

The New Internationalist

35 Riviera Drive., Unit 17
Markham, Ontario, L3R 8N4
tel: (905) 946-0407
Fax: (905) 946-0410

Reports

Compare the Share

Phase 1
Hon. Ralph Ferguson, MA
Lambton-Middlesex
October 1991, 4th Ed.

Audio Visuals

Seeds of Survival

USC Canada, 56 Sparks Street
Ottawa, Ontario
K1P 5B1, (613) 234-6827
A video and teaching kit that examines the importance of seed preservation in the human food chain and the serious challenge we face in ensuring the survival of our seeds.

Outstanding in Her Field

Media Network Society
Studio A, 666 Harold Street
Victoria, B.C., V8W 1S7
fax: (604) 360-2033
"Our aim is to inspire others to involve themselves in sustainable agriculture on any scale-to join us in this lifestyle that nurtures the ecosystem, our families and communities, and ourselves."

The Cornucopia Coalition

This Sustainable Agriculture Teachergram Series is a project of the Cornucopia Coalition.

The **Cornucopia Coalition** is a networking and educational group founded as a result of 1994's World Food Day activities. It is sponsored by the World Food Day Association in the Victoria Region. The Coalition strives to improve networking and cooperation among member groups concerned with and active in global and local food security issues; increase public awareness and provide educational resources around food security issues; support and promote sustainable agriculture; and create curriculum focussing on global and local food security.

Lifecycles was founded in the spring of 1994 by a group of youth dedicated to cultivating awareness about food production, distribution and consumption. They achieve this goal by offering their workshop "Food Machine", by linking land owners with gardeners in the "Sharing Backyards Program", and by creating community gardens. Contact **Lifecycles** at 383-5800, or at 216- 620 View Street, Victoria, B.C. V8W 1J6.

Victoria International Development Education Association (VIDEA) has existed since 1977 as a community resource focussing on global development and education. VIDEA's educational theme "Building Sustainable Communities" encompasses economic, environment and social aspects of development. Contact **VIDEA** at 385-2333, or at 1921 Fernwood Road, Victoria, B.C. V8T 2Y6.

South Island Organic Producers Association (SIOPA) was founded in 1990 by a group of local organic producers. SIOPA strives to support organic farmers by sharing ideas, building markets, and buying supplies together. Contact **Mary Alice Johnson** at 642-3671 or **Tina Fraser** at 658-4921.

Other Cornucopia Coalition members include:

Anti-Poverty Steering Committee
OXFAM Canada's Vancouver Island Outreach Project
Community Kitchens Society
Stewards of Irreplaceable Land (SOIL)
Linking Land with Future Farmers
Unitarian Service Committee
Moss Street Market
Victoria Compost Education Centre

Sustainable Agriculture

Teachergrams were produced by VIDEA. To order more Teachergrams or to get a **Global Education Resources Catalogue**

Contact VIDEA at:
1921 Fernwood Road
Victoria, B.C.
Canada V8T 2Y6
phone: (604) 385-2333
fax: (604) 388-5258

E-mail: videa@islandnet.com

or through: VGlobe - The Virtual Global Learner Centre - <http://www.islandnet.com/vglobe>



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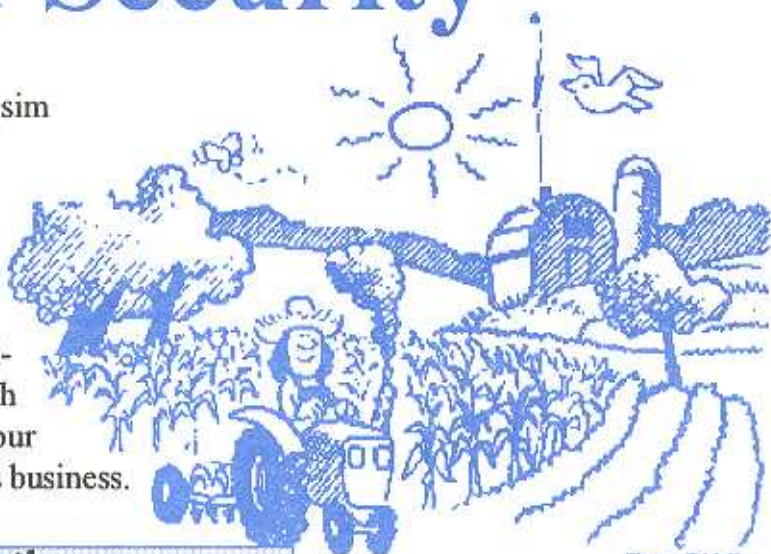
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Teacher Gram

Sustainable Agriculture Series

Food Security

We all have the right to eat. It seems simple, but it's not. To provide whole some food sustainably we need healthy soil, clean water, strong seeds, good working conditions, and fair trading practices. In other words, growing nutritious food is linked to the delicate balance of the ecosystem, *and* to the strength of our social systems and fairness of our economies. **Food security is everybody's business.**



Tony Biddle

Seed Diversity in the Saanich Peninsula

"Well, it doesn't look too good. We didn't get as much as we had hoped from our crops this year. I'm afraid that we never recovered from the drought in the spring. The crops just couldn't handle those conditions," Martha said. Her son Geordie had brought his friend Ahmed, an Ethiopian student at Pearson World College, to his parent's farm in Saanich, B.C. for the weekend. Ahmed's family were also farmers, and he was discussing the farm with Martha. Geordie overheard Martha's comment.

"Does this mean that we will have to postpone putting up the new fence next year?" asked Geordie.

"No, but it means things will be tighter than we thought. We will have to be careful" said Martha. She looked at Geordie and Ahmed.

"This is a very common story in my country," Ahmed replied. "There have been so many droughts, and many people lost their land and starved because they couldn't recover when they lost their crops, and their seed stocks".

"How hard life can be as a farmer! What are we going to do?" said Martha.

Main Ideas

- Every individual has a basic right to nutritious food.
- Food security depends on the health of global environmental, economic, and social systems.
- Sustainable agricultural practices protect our ability to feed ourselves over the long term.
- The economic survival of farmers is key to food security.

What Is Food Security?

Experts anticipate food demand increases of some 64 percent globally, and almost 100 percent in developing nations, over the next 25 years...the good news is that interest in environmentally friendly methods of agriculture is increasingly evident...only sustainable farming practices will allow agriculture to live within its means - and to begin to repay the resource debt of the past.

State of the World, 1996

Food security refers to the right to affordable, accessible and personally acceptable food at all times, for all people, for an active, healthy life. Two essential elements of food security are:

1. that nutritious food be available, and,
2. that people have the ability to acquire it in a way that is sustainable and restorative to the environment, to society and to the economy.

For universal food security to exist, everywhere, for everyone, we need to think of the whole picture in our sustainability planning.

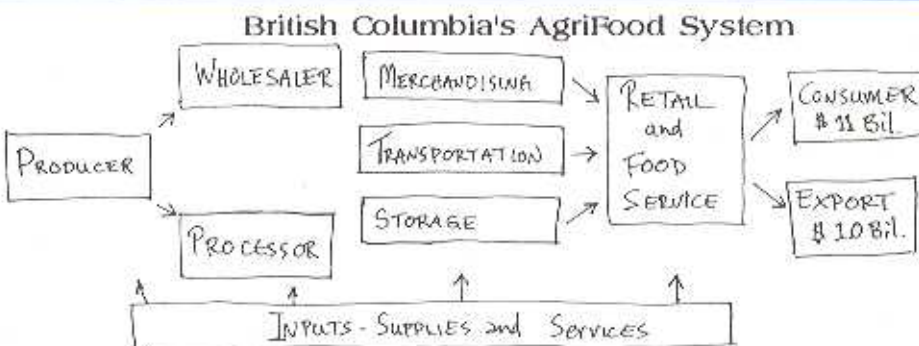
- Where is the food grown, and what are the conditions under which it was grown?
- What impact does growing it have on the environment and the community in which it was grown or processed?
- Could it have been grown locally? How did it come to this retail location?
- What is its nutritional value? Is it healthy to eat?

To plan ahead we should look at the food system as a whole, from growing to consuming. Each step of the way has a role to play.

Food Security: Systems at Work

In some ways British Columbia has great food security. Its growing, transportation, manufacturing and distribution systems are well developed and reliable. This complex network is also very vulnerable with its eroding ecological base and increased economic pressures on farmers.

The B.C. food industry contributes about \$1 billion to the provincial Gross Domestic Product (GDP), nearly 11% of the total provincial GDP from goods-producing industries. This industry is dominated by a large number of small and medium sized firms, allowing the industry to be flexible to meet consumer tastes. Fish, dairy, poultry, and meat are the largest contributors to farm incomes and to food manufacturing.



About \$1.1 billion worth is exported each year. An estimated 55% of all food processing firms are located in the Greater Vancouver area and the nearby Fraser River. Another 30% of food processing firms are located in the Okanagan Valley and the coastal regions. Materials and supplies (including packaging) are the most significant input component in the food industry at about 63% of the value of food production. Wages and salaries account for about 15%; energy at 2%; and the rest at 20%.

This section adapted from *Grow B.C.*

Why is Food Security a Sustainability Issue?

Sustainable agriculture aims to improve food security by addressing ecological, social and economic issues. To do this it supports small scale farmers, looks to increase the diversity of seed stocks, and reduces our reliance on big business to provide our food needs. It's a big challenge, and ironically we have the **Green Revolution** of the '70s to thank for helping us put food security at risk.

Dwindling Seed Stocks and Chemical Dependency

The Green Revolution of the '60s and '70s championed the application of fertilizers and pesticides to grow high yielding seeds — seeds produced through genetic breeding programs. The problem though, was that while the seeds got hooked on chemicals, farmers got hooked on the seeds — yields increased but the soil suffered. Fewer varieties of seeds became available as seed companies streamlined their stocks, just producing those seeds which required manufactured fertilizers and pesticides. As a result, the total genetic stock for the most abundant food crops has dwindled.

Strange as it may seem, the world relies on only about 20 crops for 90% of all its food. Many of these crops originated in Ethiopia. Preserving genetic diversity in seeds can help us to protect these 20 crops from drought and disease, and save us from starvation over the long term. It will also help us to preserve species that are on the verge of extinction, and help us to restore the balance of the ecosystem.

The World's Top Twelve Crops By Annual Production

Barley, Oats, Soybean,
Cassava, Potato,
Sugarcane, Corn, Rice,
Sweet Potato, Grape,
Sorghum and Wheat.

*Seeds of Survival Teacher's
Guide, USC Canada*

Farmers Index

With pressure from global food markets, farmers find it hard to make enough money on the sale of their crops to keep up. Since 1950 the earnings of farmers in Canada have been declining even though farm production has been increasing. This is not a new problem.

Canadian consumers, business and Government must realize the extreme urgency to ensure that Canadian farmers receive a fair share of the food dollar. In some cases, if the farmer gave away his product, the consumer price would scarcely change.

Compare the Share 1991

Average net farm income in Canada in 1989 - \$17,219

Average family income - \$41,083.

Value of wheat in a 450 gram box of crackers in 1980 - 9 cents.

Value of wheat in the same box in 1989 - 5 cents.

Increase in retail price of the same box of crackers - 235%.

Value of corn in a one kilogram box of corn flakes that retailed in 1989 for \$4.28 - 14 cents

Value of a litre of milk that retailed for 75 cents in 1980 - 38 cents.

Value of same litre which retailed in 1990 for \$1.48 - 57 cents.

Fraction of employed people who work in agri-food industry in Canada - 1/7.

Primary agriculture accounts for 25% of this total.

Rank of British Columbia in Canada, in farm cash receipts, in 1994 - 6th.

Value of same farm cash receipts - estimated at \$1.5 billion /year

Net farm income (after expenses) of same receipts - \$200-300 million.

Sources: The Moment, National Farmers' Union, Agriculture Canada, Grow BC, Ontario Federation of Agriculture.

Seed Diversity in the Saanich Peninsula

Martha and Geordie were walking in the fields of their farm in September with Ahmed. They had invited him back to their farm to show him the progress that they had made.

"It was just a stroke of genius for you to tell us about the 'Seeds of Survival' project in Ethiopia, Ahmed. As soon as we started doing research, we found some farmers right here in Saanich who were already doing the same thing," said Martha. She bent down and studied the seeds on a bean plant. She handed a seed to Ahmed.

"Tell me more about this program," said Geordie. "I know that in Ethiopia farmers are trying to collect native seeds from their crops and save them for hard times. Is that what you are doing too?"
"That's it. When Ahmed told us about the program, we contacted some organisations around here. We found that many farmers are already doing that right here. Each farmer finds the strongest seeds from their crops to preserve and to share them." said Martha
"Is that all there is to it?" asked Geordie.

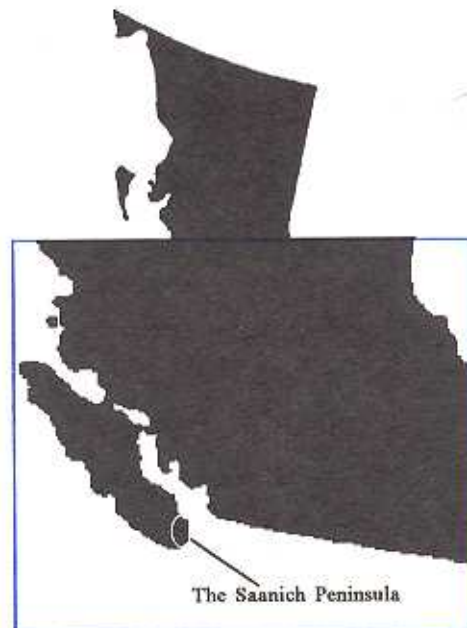
"That is part of it," said Martha, "but the other part is that using local seeds means our crops are more resistant to problems like drought, so we don't have to spend money on fertilizers and other chemical boosters."

"Even that is only part of it," she continued. "We are also looking into new markets for our crops, such as farmers' markets and street markets."

"New markets? Why?"

"Because these are local, letting us sell directly to consumers. Consumers get really fresh produce and we get a good price. Selling locally also relies less on transportation. Just think of all that pollution saved by selling our crops close by."

"Well," said Ahmed. "It sounds like you are on a whole new cycle. Saving native seeds, using less chemicals, selling locally... I am so happy that I was of some help to you."



Seeds of Survival

Ethiopia is the centre of origin for crops like coffee and teff, and the centre of diversity for many others like wheat and barley. *Seeds of Survival* was established to support Ethiopian initiatives to improve farmers' seed stock after the drought in the '80s, and to increase understanding of the important role Ethiopia plays in our global food security.



Discussion

Work on the questions first in small groups of 3 to 5, then report back to the whole class.

1. Go back and read the story from page 1. What is it about? Sum it up in one sentence. *This story is about...*
2. What does seed diversity have to do with sustainable agriculture?

Sustaining the Land...Sustaining the Farmer

Support for farmers is key to developing food security over the long term. It is a way to develop jobs, strengthen the fabric of rural communities, and provide ourselves with nutritious food. But what does supporting farmers really mean, and what is being done?

Community Supported Agriculture

Buying local produce at the store is only one way to support local farmers. We can also go straight to the farmer. Community Supported Agriculture (CSA) is a program developed by local farmers through which consumers buy shares of the yield on a farm, and receive a weekly food basket in return. This program provides farmers with consistent cash flow and a guaranteed income. It also allows consumers to build a relationship with the people who are growing their food, and to share in the bounty as well as the risk of farming. Supporting local farmers by shopping through buying co-ops and farmers markets, working with community kitchens, and establishing community gardens, we can help make fresh produce available to everyone at affordable prices.

An Interesting Note

Recommendation #3 will not be allowed under the 1996 Uruguay Round of the GATT (General Agreement on Tariffs and Trade).

Think About It

In *Compare the Share* what does it mean to "mine the soil"? Why would restricting the imports from countries practicing non-sustainable agriculture help Canadian farmers? Do you agree with these recommendations? Why or why not?

Agricultural Land Reserves

The Agricultural Land Reserve (ALR) is designed to prevent the loss of our agricultural land by preserving it from urban development. Currently, B.C. farmers use only 50 per cent of the province's available foodlands, and produce 50 per cent of its food needs. Using 100 per cent of our Agricultural Land Resources would allow B.C. to be self sufficient, and to control the safety and quality of its food more efficiently.

The Agricultural Land Reserve in British Columbia covers approximately 11.6 million acres (4.9% of B.C.'s land). ALR land occurs in every Regional District and includes private and Crown-owned land and forested, farmed and vacant land. Some ALR units are vast tracts of many thousands of acres, as in the Peace River area; others are small pockets of only a few tens of acres, as in the Gulf Islands. In total, the Agricultural Land Reserve comprises those lands within the province that have the capability to grow food.

Compare the Share

In 1991, a federal government study titled *Compare the Share: Canadian Farmers Need a Fair Share of the Consumer Food Dollar*, produced these recommendations:

1. Environmentally sustainable agriculture must be promoted and encouraged. Someone has to pay for this added Canadian responsibility. When foreign producers are allowed to "mine the soil", the competitive factors are further distorted. The answer is not for Canadian producers to "mine Canada's agricultural lands."
2. As we move to sustainable agriculture, imports of products from countries not practicing sustainable agriculture should not be permitted entry.
3. Food produced in other countries using pesticides, herbicides, and other chemicals not allowed in Canada should not be permitted to be imported into Canada.

Glossary

Ecosystem - An ordered and highly integrated community of plants and animals together with the environment that influences it.

Food Security - The right to affordable, accessible and personally nutritious food at all times, for all people, in order to lead a healthy active life.

Genetic Diversity - The way in which each individual is different in some way from every other individual of its species. Greater genetic diversity gives greater variety in a species.

Green Revolution - The term used to describe the widespread use of modern mechanized agriculture in many parts of the Third World from the 1960's onward. Although contributing to huge increases in crop yield, the social and ecological upheaval which accompanied the Green Revolution undermined its effectiveness.

Nutritious - A diet providing enough vitamins, proteins, minerals and carbohydrates for a person to lead an active, healthy life.

Sustainability - A development concept which takes into account environmental, social and economic factors of human activity. See *Teaching Guide* for more on sustainability.



Graphic from *Seeds Magazine*

TeacherGram Sustainable Agriculture Series

- Teaching Guide
- Sharing the Land
- Food Security
- Soil
- Water
- The Global Consumer

Produced by VIDEA and LifeCycles for the
Cornucopia Coalition, Victoria, B.C. Canada.

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Teacher Gram

Sustainable Agriculture Series

Sharing the Land

Land is where we live. It stretches down to the molten mass of the inner earth and up to the thin reaches of the atmosphere. It nurtures the plants and animals that provide our food and shelter. It is the reservoir for our water supply, it provides the minerals we use, the space on which we build our houses, and the site of many recreational activities. Land is our home.



Briony Penn

Protecting More Than the Harvest

"Grandma, is this what it looked like when you were a kid?" asked Nicholas.

"No way," Kira replied. The whole family had driven up to the farm for the day, and Nicholas and Kira were taking time off for a walk. "When I was growing up this was all farm land. It was fields as far as the eye could see. You know that pond by the back field? We used to swim in there every day."

"Wow, you're right it was different. We can't swim there now."

"No, Nicholas, you can't. But you know, in those days the pond was full of farm runoffs. I remember one year the weeds in the pond were so thick we were afraid of drowning. We didn't know what caused it then. But I think that by the time you grow up you will be able to swim there again," said Kira. She took Nicholas' hand and helped him over a log.

"What do you mean?" asked Nicholas, as he jumped off the log onto the path below.

Main Ideas

- The land is a living body made up of whole ecosystems.
- Land stewardship aims to strike a balance between human activity and the needs of other components of the ecosystem.
- Farmland protection is essential to building sustainable agricultural systems.

Without a major expansion of arable land, the world average of 0.28 hectares of cropland per capita is expected to decline to 0.17 hectares by the year 2025 if current population projections are accurate.

World Resources 1990-91

What is Land?

Land is a living body made up of the whole ecosystem. It is more than the sum of its parts. Just as you and I are more than walking anatomies, so the land is more than a place for soil, water, minerals and air to exist on. Land is the Earth's vital life-giving source. Just like your body or mine, it relies on all of its parts to be in healthy working order to survive.

Land boundaries are defined differently by different people. Politicians and economists often look at and divide up land in ways that do not reflect natural ecological boundaries. Whether land divisions are called countries, regions or natural resource sites, these boundaries take precedence over ecological boundaries during land planning. Moving to land boundaries defined in ecological terms is an important part of sustainability planning.

Ecoprovinces - defining the land

British Columbia's great diversity of ecosystems can be represented by ten ecoprovinces. Each ecoprovince has a unique pattern of biological and physical characteristics. Three of British Columbia's most agriculturally productive ecoprovinces are the Boreal Plains, the Georgia Depression and the Southern Interior.

Georgia Depression

Lower Mainland, Gulf Islands, Sunshine Coast, Southeast Vancouver Island

The Georgia Depression has the best climate and soils, and generates more than half the dollar value of farm sales in B.C.

Urban Centres
Vancouver
Victoria
Matsqui
Nanaimo

Main Crops
field crops

Boreal Plains

Peace River Area

Urban Centres
Dawson Creek
Fort St. John

Main Crops
grains
oilseeds
fineseeds

The Peace River Area accounts for one-half of the total cultivated crop area in B.C.

Southern Interior

Okanagan & South Thompson Basin

Urban Centres
Kamloops
Kelowna
Penticton

Main Crops
tree fruits
grapes

The Okanagan and Thompson River Basins contain the province's prime tree fruit and vineyard producing land.

This section adapted from *Backyard Biodiversity & Beyond*.
Artwork: Briony Penn

Why is Land a Sustainability Issue?

"There is a basic potentially lethal flaw at the heart of today's market-based economies. The varied and complex natural ecosystems, on which all life depends and on which the human economy is based, are treated as both limitless and, for the most part, free. The more oil we pump from the ground, the more forests we clear-cut, the more land we till, the more minerals we blast from the earth, the more the economy grows - and the richer we become." *"Building a Green Economy", The New Internationalist, April 1996*

Land Use and Farming - B.C. and Around the World

Farmers around the world are very aware of the ways in which their livelihood, and our food supply, are affected by local and global economics. After all, they are often the first ones to feel the stress for competing land uses.

o *In B.C.*

Abbotsford - Farmers stressed a need to communicate with the urban population about land use issues, and stated that native land claims should be included in land use decisions.

Creston - Farmers reported that urban development is a threat. They are concerned that farmland is being preserved in a way that is not useful for farmers, and that regulations are not rational.

Fort St. John - Farmers expressed the need for food security for Canada and B.C. They are concerned with preserving the land resource, and with conflicts of interest between rural and urban users.

Duncan - Land is not accessible to new farmers. They are concerned that their children will not be able to buy land. They suggest rezoning as a way to get a good price to retire on.

Developing an Agri-Food Policy for British Columbia. What You Said - A Summary of Consultative Meetings, 1995

o *Kenya*

Farmers in Kenya are faced with rebuilding their farms which they have been forced to flee. Since 1991, 300,000 smallholders have had to desert their lands for the shelter of churches, missions and school houses.

OXFAM Words into Action

o *South Africa*

"In 1993 we got tired of waiting, tired of promises of land".

Lungile Rex Bokuva

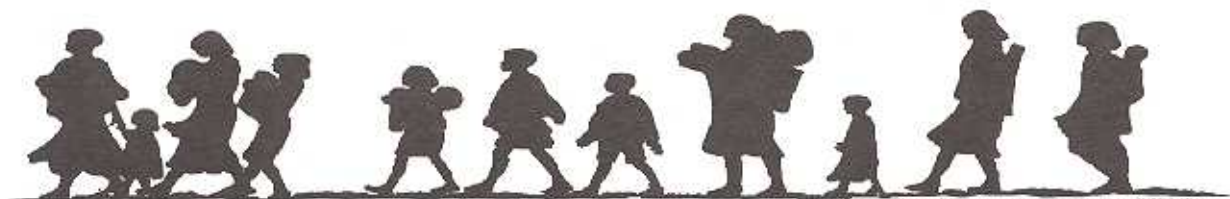
More than 70 per cent of the black population may now live in towns or large rural settlements, but many still hunger for land. It is a call from the heart as well as from the head, for 'land' has come to mean 'freedom'.

New Internationalist, March 1995

o *China*

"A land crisis is approaching...If farmland loss continues at the present rate, China will suffer a serious problem of lack of food by the beginning of the twenty-first century."

Who Will Feed China? Lester R. Brown 1995



Graphic: The Horn of Africa by VIDEA

Protecting More Than the Harvest

"Well, Nicholas, I said it was different now and it is. None of these trees were here when I was a girl, and even though they are not really big yet, they are already making a difference," said Kira.

"When did you plant them?" asked Nicholas. He stood next to a tree by the path to measure. He could almost reach the lowest branch.

"Long before you were born," Kira laughed. "But it wasn't only me. All the farmers got together to plant them after your grandfather told them about the foxes."

"Are there foxes here?" Nicholas looked around.

"Well, there used to be," said Kira, "And your Grandfather used to watch their den to see when the babies were born. Over the course of a few years he noticed that there were not as many foxes here, and then one spring they were all gone. He was really upset, because he felt that all of us farmers had driven them away."

"How did you do that?" asked Nicholas.

"By destroying their home," said Kira. "We didn't do it on purpose, but as our farms grew, we took away all the places they like to live in."

"So what did Grandpa do?" asked Nicholas.

"He spent a lot of time convincing the other farmers around here to help him restore the land. It sure took a lot of work, but now everything around us is healthier," said Kira.

"Is that why you are organic farmers?" asked Nicholas.

"It is one of the reasons. We also like the way the food tastes. But it is the reason you will be able to swim in the pond one day."

"Will you swim with us, Grandma?"

"Only in the summer," answered Kira. She once again took Nicholas' hand and they started to walk back to the house.



Discussion

Work on the questions first in small groups of 3 to 5, then report back to the whole class.

1. Go back and read the story from page 1. What is it about? Sum it up in one sentence. *This story is about...*
2. What does the title **Protecting More Than the Harvest** refer to? Do you think it is an appropriate title? What could be another one?
3. Can you think of any land in your area that has been ecologically restored. What was it like before?
4. How important is it to include the needs of wildlife when planning land use? Make a list of the best three reasons for including wildlife. Then make a list of three problems that it raises. Can these be reconciled? Come up with suggestions.

What We Can Do...

Adopting a land stewardship approach to sharing the land ensures that it is being used in a way that takes into consideration the social, economic and ecological needs of the people who use it, as well protecting and preparing the land itself for the future. The three organizations below interweave a concern for human needs and an understanding of the land.

Project Accompaniment

By 1992, 44,000 documented Guatemalan refugees lived in refugee camps in Mexico where they had gone to flee military brutality in Guatemala. In January 1993, despite ongoing military dictatorship, the first group of Guatemalan refugees returned from exile in Mexico.

Since their arrival in Mexico, the Guatemalans have been working towards returning to their homeland. The vast majority of this population are indigenous farming families and their connection to the land is profound.

Project Accompaniment is a volunteer network across Canada working in concert with the Guatemalan refugees' organization known as the Permanent Commissions. Members of Project A are facilitating a co-ordinated Canadian response to the refugees' request for international accompaniment as they return to their homeland under dangerous conditions.

One of the conditions that were agreed upon between the Permanent Commissions and the Guatemalan government was that the returning refugees have the right to return to, and take possession of, the former lands. Project A wishes to develop Canadian support and solidarity for the Guatemalan people in their struggle to establish a just and peaceful homeland.

To contact Project Accompaniment:
P.O. Box 78080
2606 Commercial Drive
Vancouver, B.C. V5N 5K7
tel: (604) 875-6003
fax: (604) 872-0709

The Salvadoran Centre for Appropriate Technology

Shocking images of war, human rights abuses and death. This is what we saw of El Salvador in the 1980's. But with the signing of the peace accord in 1992, the drama and tension in the country decreased, and the media headed for other war-torn hot spots in the world. As the dust settles in El Salvador's countryside, it reveals a landscape scarred by war and centuries of exploitation of the land and the people. The country is classified by the United Nations as the second most ecologically devastated country in the western hemisphere - leaving Salvadorans with both their society and environment to rebuild. This challenge is where CESTA (the Salvadoran Centre for Appropriate Technology) is focussing their energy. One of CESTA's projects is the "Forest of Reconciliation" in which one tree is being planted for each of the 75,000 people killed during the war. The forest is a memorial to those killed in the war, and at the same time a solution to an environmental problem. They hope the forest will stop erosion, attract wildlife, and even bring back the rain. It is a way to turn an area of war into an area of peace.

To contact CESTA: e-mail the Gaia Project at vwave@islandnet.com or phone (604) 384-1534.



Kootenay Permaculture Institute

Since 1991 apprentices and farmers have been designing and implementing the principles and techniques of permaculture on a 10 acre farm in the Slocan Valley. On this farm crops or livestock are not the only concern. The ethical basis of permaculture means that care of the earth, and provision for all life systems to continue and multiply, are of primary importance to the farmers. Permaculture is also based on caring for people, and sharing surplus, whether it be ideas, skills, food, or goods. At the Kootenay Permaculture Institute apprentices come to learn about permaculture by direct experience and by doing research of their own. The program bridges the gap between theory and practice.

To contact The Kootenay Permaculture Institute:

Box 43, Winlaw,
B.C. V0G 2J0
tel: (604)
226-7302



Glossary

Ecosystem - An ordered and highly integrated community of plants and animals together with the environment that influences it.

Permaculture - A land use theory based on the idea that humans are only one of the life systems that use the land, and that human useage of the land should not destroy it for other users.

Urbanization - A process leading to a profound societal change, characterized by the movement of people from rural to urban areas. Urban areas have become increasingly densely populated, as displaced farmers move in search of work.

Land Stewardship - An approach to sustainable agriculture that shares qualities with the deep ecology movement.

Dominant Worldview

Dominance over nature

Natural environment as resource for humans

Material/economic growth for growing human population

Belief in ample resource reserves

High technological progress and solutions

Consumerism

National/centralized community

Deep Ecology

Harmony with nature

All nature has intrinsic worth/biospecies equality

Elegantly simple material needs (material goals serving the larger goal of self-realization)

Earth "supplies" limited

Appropriate technology; nondominating science

Doing with enough/recycling

Minority tradition/bioregion

"Deep Ecology: Living as if Nature Mattered"
Bill Devall George Sessions



Graphic from *Ecoforum*, Journal of the Environment
LiaisonCentre International, Nairobi, Kenya

TeacherGram

Sustainable Agriculture Series

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Teacher Gram

Sustainable Agriculture Series

Soil, the Biosphere's Foundation

Soil is the biosphere's foundation. This idea is key to understanding the role of soil in maintaining a healthy balanced ecosystem. Soil is part of the skin of the earth — the incredibly diverse and vibrant layer of living and non-living matter which covers the planet. Soils provide an essential link in the endless ecological cycle of life and death as a foundation for plant growth and a site for organic decay.



Saving Soil in the Peace River Valley

"Our soil is literally flowing away" said Annie. She sighed and bent down to pull off her gumboots. They were covered in a thin film of mud. It was 1978, and she had just come in from surveying the soil on the farm in B.C.'s Peace River Valley that she and her husband Jacques owned and lived on. She moved from the doorway and sat down at the table next to Jacques. "We can't sustain this any longer, the erosion is killing the farm", she said. Jacques reached to the middle of the table and poured two cups of coffee.

"I don't see that we have much choice," he said, handing Annie a cup. "It's all the chemicals. They kill pests and feed the crops, but they kill the soil in the process. And the acid levels are way up too." He stirred sugar into his cup, and sipped it slowly. "But, if we stop using them now, we won't have a big enough crop to pay the bills."

Annie looked at him, "We've got to do something,

Main Ideas

- Soil is living.
- Soil degradation and urbanization of farmland is a threat to food security.
- Soil conservation is a key feature of sustainable agriculture.

"Soil has been described as a nation's most precious resource, since food supply depends on it."

*Development, Spring 1992,
CIDA (Canadian International
Development Agency)*

What is Soil?

Soil is alive! It is a complex community consisting of a number of layers. The thin top layer or **humus** is made up of plant remains, animal wastes, and decaying insect and animal bodies. Most of the activity in the soil community takes place in the humus and it is home to a variety of **decomposers** including bacteria, mold, fungus, beetles, centipedes, millipedes, ants, mites, snails, grubs, roundworms, and earthworms. The layers below the humus are combinations of the rich material of the top layer and sand or clay.

The health of the soil is directly related to the health of the organisms living in it. Healthy soil is the result of an interplay between physical, chemical, and biological factors. It is essential to plant growth and to holding ground water, oxygen, and minerals. In a balanced ecosystem the soil is able to regenerate itself without the addition of fertilizers and pesticides. Plants get the nutrients that they need to grow from the soil. When they die those nutrients are returned to the soil. The soil acts as a recycler, turning "waste" material back into a useable form.

A Close Look at Soil



Soil is the upper portion of a part of the Earth's crust, sometimes called the regolith. This overlies the solid bedrock or parent rock of the earth. In some places the regolith is very thick, in others very thin. Soils generally vary from three to six feet in depth.

Most of the world's soils are classified as mineral soils because the organic content, even in topsoil, is very low, usually five percent or less.

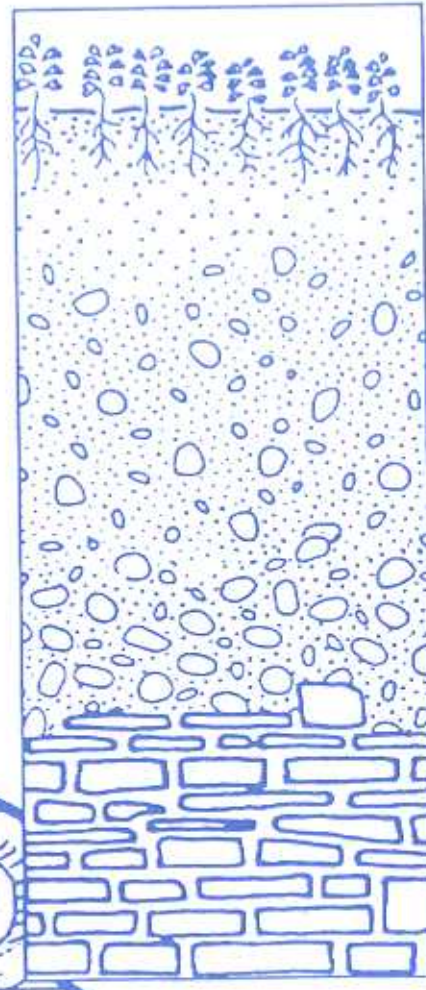


The rest of the bits and pieces that make up "dirt" are various minerals. Thousands of soil types exist.

Soils are classified according to complicated and detailed systems based on such things as the type of rock the soil originated from, how it got there and how deep it is, what type of plant cover it supports, and its texture, organic and nutrient content. But whatever you call it, healthy soil is essential for sustainable agriculture.



*(Soil creatures this page from
Backyard Biodiversity & Beyond)*



surface layer
plant material and
weathered rock

middle layer
clay and partly
weathered rock

parent material
unweathered rock

Why is Soil Conservation a Sustainability Issue?



To biologists soil is a bridge between the inanimate and the living; to agricultural specialists, soil is the **biosphere's** foundation; to most farmers, the way to avoid famine and misery. Soil is all this and much more, for it has been proven that there is far more biological complexity in a handful of our planet's soil than on the entire surface of Mars or Jupiter.

CIDA (Canadian International Development Agency)
Development Magazine, Spring 1992

Soil! Going, Going, Gone...

To most people soil is just 'dirt', but to the earth's ecosystems soil is 'life'. Ever since the large scale mechanized agriculture started in the 1960s, we have generally been treating the soil as an expendable resource; once gone to be replaced with yearly inputs of imported chemicals.

Soil Degradation

Since the 1960's, farming techniques have focussed on increasing crop yield mostly through the use of specialized **monoculture** crops. Monoculture crops have less resistance to disease and pests so large inputs of **pesticides** are required. **Monocropping** also requires high chemical fertilizer inputs. The long term effect is a depletion of the soil's natural nutrient base. This in turn effects the physical properties of soil including its ability to stay in place or its ability to retain moisture and nutrients.

○ Salinization

Although all soils contain dissolved minerals, very few plants grow well in highly saline soils. Irrigated land is susceptible to salinization because as the water evaporates it brings salts to the surface.

○ Erosion

When water fails to percolate into the soil it moves across the land as run-off. Soil without moisture becomes vulnerable to wind **erosion**. Erosion not only reduces the amount of land available for farming it also effects the long-term productivity of the soil and the amount of nutrients available for plants.

○ Compaction

Compaction is the disruption and reduction of spaces within the soil structure. Roots, air, and water movement in a compacted soil are restricted. This results in a reduction of plant growth and in the population of soil organisms. Compaction can be caused by excessive tilling, the use of heavy machinery on moist soil, and by livestock.

In B.C., "all of the nearly 400,000 ha of grain growing land in the Peace River is classified as high erosion risk, and 15% already shows evidence of erosion".

State of the Environment Report for British Columbia, 1993.

Saving Soil in the Peace River Valley

"Remember when we used to worry about the rain Annie?" said Jacques.

"Yea, but not any more" she said. It had started to rain, but they were warm from working and they were enjoying a moment to look at their crops. Years ago when they were losing lots of soil, Jacques and Annie started looking for alternatives. Even though their soil was being degraded by too much pesticide and fertilizer use, they also knew that if they changed their farming practices overnight they wouldn't be able to pay their bills.

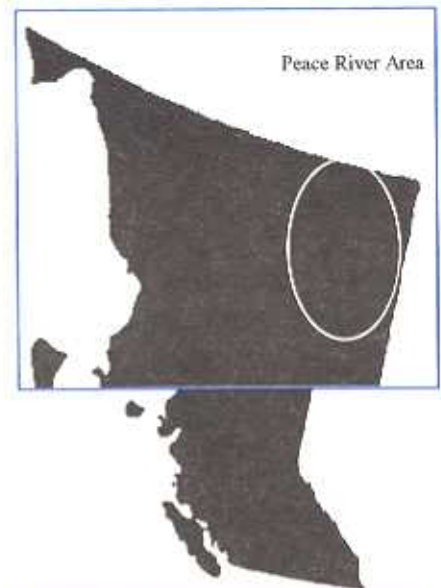
Now, almost twenty years later, they were using less than one-third the fertilizers and pesticides. Leaving a greater percentage of crop residue on the land after harvest and planting clover as a green manure crop cover had really helped. "We don't lose nearly as much soil in the spring run-off as we used to." said Annie.

"It was tough for a while there buying compost. It was money that we hadn't accounted for." said Annie. "I know," said Jacques "but it was an important step in replenishing the soil, until we were making enough ourselves. Also, the more we relied on compost and green manure instead of fertilizers, the more success we had in bringing down the acid levels of the soil."

"And don't forget my mother's mixed cropping advice. Mixing peas and rye really did reduce pests."

Jacques laughed, "Well, she *was* right. Planting only one crop was one of our biggest problems. These new crops not only keep the pests down, they also help to put new nutrients back into the soil. Now that it's starting to get healthier, it can hold water better too."

As they turned to get out of the rain, which had begun to fall more heavily, Annie said, "It's really nice to see the green of spring crops growing."



The Peace River Valley represents 50% of the cultivated crop area in British Columbia. This land is devoted to growing grain, oilseeds and fineseeds. Soil erosion is a problem here, partly due to current agricultural practices. Nearly all of the 400,000 hectares of grain growing land is classified as being at risk of high erosion, and 15% already shows evidence of erosion.

The Canada- British Columbia Soil Conservation program promotes conservation farming to reduce soil erosion in an economical manner for the Peace River grain and oilseed producers.

A recent survey indicated that a majority of Peace River producers plan to purchase conservation tillage equipment in the future; and that they believe their economic status would be maintained or improved by adopting soil conservation management practices.

The State of the Environment Report for British Columbia, 1993.

For Discussion - in small or large groups

1. Make a list of the steps that Anne and Jacques took to restore their soil.
2. For each item on the list, state why it improved the soil.

What is Being Done to Improve Soils ?

A lot is being done to conserve and improve soil - by farmers, by government and even by city folk! Farmers however, are the first line of attack. They were also the first ones to recognize the seriousness of the problem. Combatting soil erosion and decreasing soil fertility is not new to farming. However, approaching soil erosion within a broader sustainability plan is.

National Soil Conservation Program

In Canada, the National Soil Conservation Program of the Ministry of Agriculture helps farmers adapt crop and animal production systems that are both environmentally sound and economically viable. For example in the 1960's an **integrated pest management (IPM)** approach in British Columbia's fruit growing Okanagan Valley led to a reduction of certain pesticides once it was discovered that they were harmful to an orchard mite which preyed on other harmful mites.

Community Composting

In British Columbia, the Victoria Compost Education Centre has taught hundreds of city dwellers how to compost in their own homes and schools. They provide information and workshops to help people set up composts under their sinks, in garages, or in the garden itself. Individuals and families can use the soil from their composts in gardens and pots to grow fruit and vegetables for themselves.

THE SUSTAINABLE FARMER'S CHALLENGE

THE SUSTAINABLE FARMER'S CHALLENGE IS TO REDUCE THE IMPACT OF INSECT PESTS AND WEEDS BY ADOPTING PRACTICES THAT ENCOURAGE THE DEVELOPMENT AND MAINTENANCE OF A HEALTHY SOIL.

GUIDELINES

It is crucial to return the nutrients that farming removes from the soil. Adding **compost**, **compost tea** and **manure** increases the organic material present in the soil and provides food for soil organisms. Lime, bone meal, blood meal and kelp meal can be used as organic fertilizers. Planting legumes and green manure covering crops (buckwheat, rye, cowpea, Austrian pea) returns nitrogen and other essential plant nutrients to the soil.

Crop rotation builds a stable soil structure, increases organic matter and improves the porosity and structure of the subsoil. By growing a variety of different crops from year to year the land's susceptibility to erosion, weeds, and the buildup of soil-borne plant diseases is reduced. **Cover crops** are also used to control wind and water erosion and suppress weed growth. Alfalfa is a salt resistant cover crop. It helps keep water levels down and reduces salinization.

Mulching leaves at least 30% of the crop residue on or in the soil each season. Retaining this residue at the soil surface reduces soil erosion and improves water retention. It also helps to minimize the impact of **farm operations** (tractors etc.) on soil structure because it adds fibre and reduced compaction. This mechanical or physical way of handling the soil is called **conservation tillage**. Terracing is another example of conservation tillage.

Integrated pest management is a pest control method which uses a combination of techniques including biological control agents (predator insects), physical control (cultivation or weeding), and selective pesticide use. This use of IMP means that chemical treatments on soils are reduced or not needed.

Glossary

Biosphere - the Earth

Compost - Rotted plant and animal wastes for use on gardens or farms. Compost returns nutrients and minerals to the soil and feeds soil organisms.

Compost Tea - Compost diffused in water.

Conservation Tillage - A cultivation and planting system which leaves 30% of the previous crop residue on the soil surface after planting. Examples include: no-till, direct seeding, minimum till, plow-plant, etc.

Cover Crop - A crop of close-growing forages or small grains grown primarily for the purpose of soil protection and improvement between periods of regular crop production.

Crop Rotation - Planting a field with different crops from year to year. Rotation crops can be used to add nitrogen, nutrients and organic material to the soil, provide soil cover and help reduce erosion.

Decomposers - Organisms in the soil that make things rot (such as bacteria, worms, and pill bugs). Decomposers breakdown the complicated chemicals in dead plants and animal wastes and turn them into the simple nutrients that plants need to grow.

Desertification - When good soil turns into sandy desert.

Erosion - Loss of topsoil when it is swept away by wind or water.

Fertility - The ability of soil to make plants grow. A fertile soil contains the right combination of chemicals, minerals and nutrients that plants need to grow. Fertility is directly related to the health of soil creatures.

Fertilizer - Something that is put on soil to provide the nutrients that plants need to grow. Animal manure and plant material are called "organic" fertilizers. Factory-made fertilizers are sometimes called "chemical" fertilizers.

Green Manure - Crops grown specifically to build up fertility and life in the soil by adding nitrogen to the soil, fixing free carbon, and building humus. Examples of green manure crops are alfalfa, clover, buckwheat, rye, a variety of legumes and clover.

Humus - The rotting organic matter found in soils. True humus has decomposed to the point where the original organic material can't be recognized any longer.

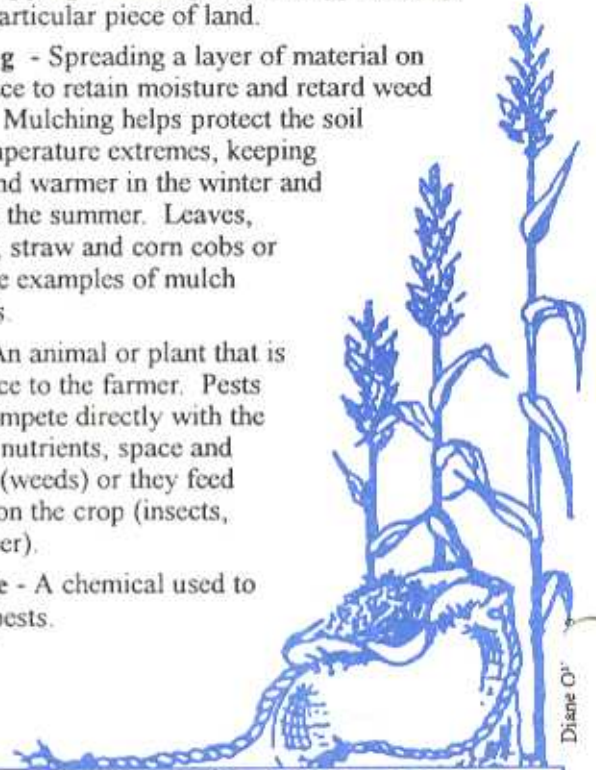
Integrated Pest Management - An approach to pest control which uses a combination of physical, chemical and biological controls.

Monocropping - Planting only one type of crop on any particular piece of land.

Mulching - Spreading a layer of material on the surface to retain moisture and retard weed growth. Mulching helps protect the soil from temperature extremes, keeping the ground warmer in the winter and cooler in the summer. Leaves, seaweed, straw and corn cobs or stalks are examples of mulch materials.

Pests - An animal or plant that is a nuisance to the farmer. Pests either compete directly with the crop for nutrients, space and sunlight (weeds) or they feed directly on the crop (insects, birds, deer).

Pesticide - A chemical used to control pests.



Diene O'

TeacherGram Sustainable Agriculture Series

- Teaching Guide
- Sharing the Land
- Food Security
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- The Global Consumer

*Produced by VIDEA and LifeCycles for the
Cornucopia Coalition, Victoria, B.C. Canada.*

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Teacher Gram

Sustainable Agriculture Series

Water, the Source of Life

All living things depend on water for their survival. From the smallest insect to the tallest tree, we all need water to grow and survive. Water circulates throughout the environment, from the atmosphere to the earth and back again. Its preservation and quality directly affect the health of entire ecosystems.



Water To Bet Your Future On

"I'm thirsty, let's take a break." Jahangir walked between the rows of strawberries to the end, where he picked up his thermos. He opened it and took a long drink. He was about to put a handful of strawberries in his mouth when his friend Balasz said "No, don't do that, they have been sprayed, you know." Jahangir poured a bit of water out of his thermos over the strawberries and watched it drain into the soil.

"Yuck, the water from this field runs right into the Fraser River. It must be full of manure and pesticides." said Jahangir.

"And a lot of other things" said Balasz. "It's killing the salmon, and it's our drinking water too" he said, holding up his thermos for emphasis.

"Yeh, we're drinking it too. But we're just a small farm. What can we do?"

Main Ideas

- Water is an essential element of life.
- Surface contamination and groundwater depletion threaten human and ecosystem health.
- Conservation farming, collaborative watershed management and domestic care with pesticides all contribute to healthy water systems.

"Canada's supply of over 100,000 cubic metres of water per person ensures not only sufficient water for survival, but for ecosystem health, wildlife needs, recreational uses, and abundant hydroelectric power as well."

World Resources
1994-95

Why is Water So Important?

Water is what we drink, wash with, and feed our plants with. It forms between 55% and 65% of the human body. It is also essential for plants to carry out photosynthesis. It is the basis for all life! Water is found throughout the biosphere, in rock, the soil, plants, animals, and the air. It circulates throughout all components of the environment, from the atmosphere to the earth and back again. It is constantly in motion, and its molecules pass through trees, frogs, giraffes, hippos, penguins, bobcats, humans...on and on in an

What's Up With Water

○ Where is the Water?

Ninety percent of the world's water is contained in salt oceans; of the remainder, 69 percent is in the form of snow and ice. Freshwater for human use, found in lakes, swamps, rivers and underground, makes up only 0.008 percent of the Earth's water.

Groundwater

Ninety-eight percent of the world's freshwater is underground. It is our hidden treasure. It hides in soil pores, rock fractures, faults and joints. These caches of water form **aquifers** which we reach through wells, boreholes and mines.

Streams, lakes, rivers and estuaries cover 1.25% of the province of B.C.

Industry is the largest single user of groundwater in B.C., followed by agriculture and municipal use.

○ Who Is Using the Water?

Since the 1950's the world's use of water has increased three and a half times. This demand for freshwater continues to grow with the human population. The diversion of water to supply agricultural, industrial, and domestic needs stretches water systems to the limit. Within a nation, these various needs compete for a supply of freshwater that may already be scarce and may vary drastically season-

Select Industrialized Countries' Water Usage

Per capita cubic metres / year

United States	2,300
Canada	1,500
Australia	1,210
Japan	900
Italy	900
Spain	900
Portugal	900
Belgium	900
England	225
Switzerland	110

Source: Environment Canada

Freshwater Use by Region

As a percentage of total use

Region	Agric.	Dom.	Indust.
World	8	23	69
Africa	7	5	88
Asia	6	8	86
North and Central Am.	9	42	49
South Am.	18	23	59
Europe	13	54	33
USSR (former)	7	27	65
Oceania	64	2	34

ally and geographically. Among nations, competition for water of high quality is often a cause of conflict. The importance that nations attach to their water resources is reflected in the over 2,000 treaties relating to common **watersheds**.

Why is Water a Sustainable Agriculture Issue?



Globally, new technologies and the demand for greater agricultural productivity have led to an exponential increase in the use of fertilizers and pesticides. The runoff of these chemicals, particularly nitrogen, creates one of the most widespread and serious of all water quality problems, particularly in industrialized countries.

○ Surface Water Contamination

Runoffs from agricultural lands are frequently saturated with fertilizers, pesticides and various other chemicals. This reduces water quality and raises potential health concerns.

In the Central Interior region of British Columbia, where beef production is the dominant agricultural activity, animal waste runoff from livestock facilities and feedlots is a significant contributor to the degradation of lakes, creeks and streams. Animal wastes are especially high in nitrogen. When leached into surface water, nitrogen can cause a rapid increase in the growth of algae and other aquatic plants. This in turn, depletes dissolved oxygen in the water resulting in the suffocation of fish, insects, crayfish and other aquatic creatures.

○ Depletion of Ground Water

There has not been enough surfacewater to meet our water needs. **Groundwater** for irrigation has had to be mined from some of the vast amounts of water stored underground in **aquifers**, a process which can lower the **water table**. Even groundwater thought to be deep and clean has become very polluted.

○ The Human Costs

Dirty water is one of the world's greatest killers. Globally, twenty five thousand people die daily from using dirty water. In B.C. over 1.5 million people live in communities which lack or have minimal sewage treatment.

○ Around the Globe

Crop production is a highly water-intensive activity. Worldwide, agriculture uses about 65 percent of all the water removed from rivers, lakes and aquifers for human activities, compared with 25 percent for industries and 10 percent for households and municipalities.

Crop production is a highly water-intensive activity...

Water removed from rivers, lakes and aquifers worldwide that is used for agriculture - 65%

Water removed from rivers, lakes and aquifers worldwide that is used for industry - 25%

Tons of water needed to produce a ton of harvested grain - 1,000

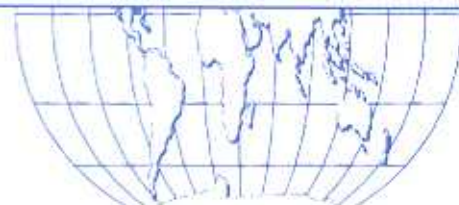
Percentage of the world's cropland that is irrigated - 16

Percentage of the world's food that comes from irrigated land - 40

Average kilograms of grain per year each person consumes - 300

Estimated amount of water in billion cubic metres it will take to meet the world's grain requirements by the year 2025 - 780

Source: State of the World 1996



Water To Bet Your Future On

"The thing I like the best is having strawberries that you don't have to wash before you eat," said Morven. She and Jahangir were standing next to a strawberry plant, it was picking season again. She popped a strawberry into her mouth.

"It really made sense to do all those things you and Balasz proposed. I must admit, though, I was scared to stop using the fertilizers. I thought that the crop would be small. Concentrating on keeping the soil healthy with crop covers and buckwheat as green manure has really worked for us though," she said.

"It really has" Jahangir replied. He too had stood up and was eating strawberries from the plant he had been picking. "By the way, have you figured out how much water we have saved since we put in those new sprinklers?"

"Yes indeed. We are using one third as much water in irrigation this year," she said. She bent back down to continue picking.

"The savings are good, but that's not the thing that really thrills me. It's the thought that the water we use is so much cleaner when it leaves our farm and goes into the river. Once all the farmers around here start doing this the river will really have a chance."



Wise Water Management

In Sweden, industries which want to use water apply to the national Franchise Board for Environment Protection for permits. They are required to provide detailed reports regarding effluents or emissions to land, water and air. Once the permit has been approved, industries have to comply with the stipulations or face fines, even closure.

Farmers in Israel have addressed water shortage by recycling urban wastewater to irrigate their crops. Farmers can work with municipalities to redirect treated wastewater to their farms for irrigation.

Discussion

Discuss the questions first in small groups of 3 to 5, then report back to the whole class.

1. Go back and read the story from page 1. What is it about? Sum it up in one sentence. *This story is about...*
2. How often do you think about pesticide residue on the produce that you eat? How important is it to you?
3. Are you willing to pay more for food that was grown without the use of pesticides? Why or why not?
4. What does the title mean? Come up with another title.

What is Being Done to Improve Water Quality and Water Reserves?

Clean and plentiful water is everybody's business. Sustainable water use is being addressed by farmers, by government and by people everyday in their homes. It's easy, once you are used to thinking sustainably.

○ Conservation Farming - *Farmers in Action*

Farmer using sustainable practices adopt water management techniques which have an effect far beyond his or her farm. Reducing water use starts with choosing drought resistant seeds that are well suited to the soil and climate of the farm. Covering the soil with composted humus materials such as seaweed, lime, bonemeal, or kelpmeal creates healthy, chemical-free soils. Planting hedgerows and trees to stop erosion helps to keep water in the soils where plant roots can reach it. Many sprinkler systems waste up to two-thirds of the water because they spray into the air. Farmers are changing their sprinklers to water the roots directly. Improved irrigation channels also reduce the amount of wastewater.



Turning Manure Into Money

The South Coastal Dairy Education Association has been developing, evaluating, transferring and encouraging dairy producers to adopt farming practices that sustain soil and water productivity. They do this by providing dairy producers the latest information on environmentally sustainable farming practices, showing producers how to keep track of their field management practices and providing on-farm demonstrations.

One project in the Fraser Valley shows how both the environment and the economy can win; even when knee-deep in poultry manure. Testing in the Abbotsford area has shown that groundwater contains excessive levels of nitrates because of the heavy use of poultry manure by raspberry producers. To reduce this pollution, the Fraser River Action Plan is working with the B.C. Ministry of Agriculture, and Fisheries and Food and Agriculture Canada, to sell the excess manure and remove the problem.

Fraser River Action Plan
Communications Officer, Environment
Canada, 224 W. Esplanade, North
Vancouver, B.C. V7M 3H7

○ The Fraser River Basin Management Plan (FRAP) - *Building Consensus*

Canada's fourth largest river, the Fraser River flows 1,375 kilometres from the Rocky Mountains to its delta on the shores of the Pacific. Urban and population growth, industrial development and expanding resource extraction all add stress to the river basin's ecosystems in the form of pollution in the river, a decline in salmon stocks, contaminated water supplies and destruction of fish and wildlife habitats. But the story is not all bad.

FRAP is an active partner in seven demonstration watersheds throughout the Fraser River Basin. Its plan of action includes working with partners and stakeholders to manage the Fraser Basin in a sustainable manner. From fish habitat restoration, to enforcing anti-pollution laws, to working with First Nations people, FRAP is planning sustainably.

○ Act Locally - *Domestic Responsibility*

The improper use and disposal of domestic pesticides and hazardous wastes contributes greatly to the contamination of surface and groundwaters. Some of these materials accumulate in the food chain and become very toxic to various forms of life.

- Alternatives to using pesticides for the control of garden pests
- pulling weeds by hand
 - pulling off and disposing of infested leaves
 - picking off larvae
 - using an insecticide soap solution to dislodge or suffocate insects
 - rotate garden crops each year to control soil-borne diseases
 - use natural fertilizers such as bonemeal or compost.

Glossary

Aquifer - Porous, permeable rock layer that absorbs and traps water.

Biodegradable - Something that can be readily decomposed by bacteria.

Biosphere - The part the of planet that sustains life.

Condensation - As vapor rises, it cools and eventually condenses, usually on tiny particles of dust in the air. When it condenses it becomes a liquid again or turns directly into a solid (ice, hail or snow). These water particles then collect and form clouds.

Domestic Water Use - Water use at the household level for washing, cooking and recreation e.g. watering lawns and pools.

Emissions - Substances discharged into the environment.

Groundwater - Subterranean water is held in cracks and pore spaces. Depending on the geology, the groundwater can flow to support streams. It can also be tapped by wells. Some groundwater is very old and may have been there for thousands of years.

Habitat - Natural home of plant or animal.

Industrial Water Use - Water used by factories, refineries, mills, smelters and many other means of manufacture.

Irrigate - Supplying with water using ditches, canals and sprinklers.

Precipitation - Precipitation in the form of rain, snow and hail comes from clouds. Clouds move around the world, propelled by air currents. For instance, when they rise over mountain ranges, they cool, becoming so saturated with water that water begins to fall as rain, snow or hail, depending on the temperature of the surrounding air.

Per Capita - Per person.

Percolation - Some of the precipitation and

snow melt moves downwards, percolates or infiltrates through cracks, joints and pores in soil and rocks until it reaches the water table where it becomes groundwater.

Renewable Resource - Able to be regenerated (soil, water, trees). Contrast with non-renewable resources, which cannot be regenerated (coal, oil).

Runoff - Runoff is the visible flow of water in rivers, creeks and lakes as the water stored in the basin drains out.

Transpiration - Water vapor is also emitted from plant leaves by a process called transpiration. Every day an actively growing plant transpires 5 to 10 times as much water as it can hold at once.

Watershed - The entire area drained by a waterway, or which drains into a lake or reservoir. Also called a water basin.

Water Table - The level to which water will rise in an open well.

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Teacher Gram

Sustainable Agriculture Series

The Global Consumer

Consumerism is something we all take part in. When we buy food at the grocery store, or at a cafe or restaurant, we are consumers. Consumerism and food production are closely linked. They both are complex systems involving many of the same actors - from farmers to truck drivers to shop keepers. As consumers we have a significant impact on food production systems. Our choice of what and where to buy food affects the farmers who produce it, as well as the health of our families *and* the environment.



Just What Are We Paying For?

"Wow, look at this receipt. I can't believe how much we are paying for food in this city". Alexandra and Marshall had just moved to Victoria from Ontario and were doing their first grocery shopping.

"Half of the fresh stuff isn't even ripe," said Alexandra. "And look where it comes from. These oranges must have travelled at least one thousand miles. Just think of all the travelling and handling to get them here. I wonder if it's worth it."

She picked up one of the cloth bags of groceries and handed the other to Marshall. They walked out of the store.

"It is strange, don't you think, that food prices are increasing, and yet so many farmers are having a hard time all across the country. Something is wrong," said Alexandra.

"You're right. It doesn't make sense. What are we paying for?" asked Marshall.

Main Ideas

- Eating food links us to farmers and environments all over the world.
- Consumer food choices have social, economic and environmental impacts.
- Consumer food choices can have a positive effect on the health of individuals and families.

Con-sump-tion\

all of the goods and services used by households including: 1.purchased commodities at the household level such as clothing, food and utilities, 2.the goods and services paid for by government such as defence, education, social services and health care;and 3.the resources consumed by business to increase their assets such as business equipment and housing.

Our Ecological Footprint

How Does Consumerism Connect Us to Food Systems?

Every time we buy something we are consumers. Each time we buy an item, whether we buy clothing, household needs, or food, we give our approval and support, at times unintentional, to those who have produced it, and the way it has been produced.

Consumerism links us to the global food production system. When we buy food in a store or market, or eat in a restaurant, we participate in a system that brings food along a chain that starts with the land and leads through farmers, handlers, processors, packagers, transporters, wholesalers, and distributors, before it reaches us as consumers. The food may have come from anywhere in the world, so our choice to buy it can have a far-reaching impact.

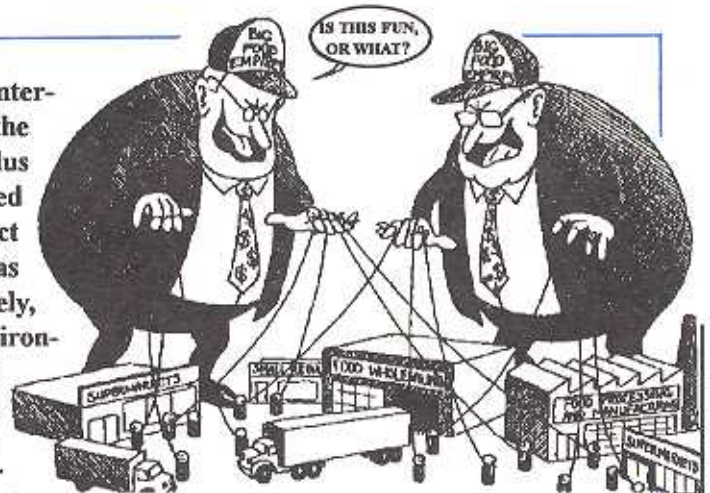
This complex system handles food as a commodity, causing its price on the shelves to reflect its market or consumer value, *not* the need for everyone to afford it. This creates food insecurity. It happens in poor countries and it happens in industrialized nations' cities. Food, food everywhere, but not a penny to buy it.

Food: Market Commodity or Basic Necessity?

The concentration of food production and distribution by agribusiness firms has benefitted the consumer with greater variety, lower prices and faster delivery - but at what cost? With so much dependence on complex systems to produce and deliver food, people run the risk of doing without if the systems break down, or if the company sells it elsewhere at a better price - as in the case of war-torn or poor countries.

Agriculture has been transformed from a family enterprise to an industrial one. Farms once served the local community first, and then exported any surplus production. Agriculture is now almost totally directed by transnational corporations, with the end product destined for export. One outcome of this system has been lower food costs for the consumer. Unfortunately, these benefits have come at an enormous cost. Environmental destruction, consumer manipulation and declining food quality are all side-effects of the contemporary food system. Consumers have lost control of the very system that supposedly fulfills our needs. In Canada, the retail food industry is controlled by fewer than a half dozen companies.

"In 1952, Canadians paid an average of 21.6% of their incomes for food. By 1992, this figure dropped to between 9% and 14%. The second lowest in the industrialized world, after the USA".



MAJOR PLAYERS IN THE FOOD SYSTEM GAME

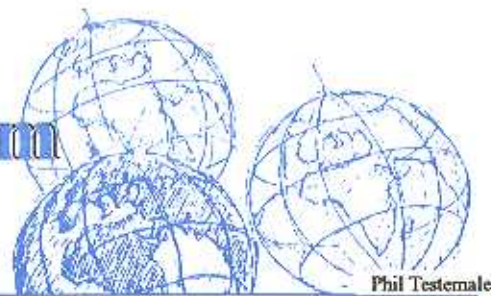
Something to Think About

Drawings and cartoons, often carry a lot of bias — views and attitudes from one particular perspective. What bias is found in this cartoon?

This box adapted from *Food for Thought & Action, The Moment, Number 23, 1995*

Graphic by Tony Biddle

Why is Food Consumerism a Sustainability Issue?



The average Canadian needs 4.27 hectares of land to maintain our consumption patterns, including food consumption. This 4.27 hectares is called our 'ecological footprint'. If all people in the world were to use as much land as Canadians, we would need three earths to live on. The act of eating often ties us into systems and resources which go far beyond the farm and our tables. When we eat, we consume a lot more than food: fuel, water, labour...

From One Peach to Another

"Hi, I'm from Florida, where are you from?"

"Hi, I'm from the Okanagan Valley in British Columbia, Canada. Why do you ask?"

"Well, you're a little expensive, aren't you. What makes you so great, you're just a peach like me."

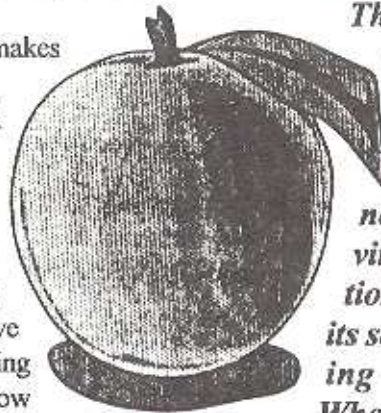
"Oh no, not just a peach. I'm a B.C. peach picked fresh this morning, juicy as a watermelon, tasty as can be. What about you, when were you picked?"

"Oh, a few days ago. I had a long way to travel. To tell you the truth, I don't feel too well."

"Well, Mr. Florida, I'm surprised that you're so cheap since you've cost the rest of us so much, we've already paid your price in pollution from the trucking it took to get you here. And I can tell from your sallow look that you have lost a lot of your nutrition, too."

"I'm still twenty cents cheaper than you are. I bet consumers"

"Not if they're thinking sustainably - they won't!"



Think About It

The dialogue between these two peaches illustrates why food consumerism is a sustainability issue. The price of food does not necessarily reflect its true environmental costs (e.g. pollution from transportation), nor its social costs (e.g. undermining of small-scale farmers). What other environmental, or social costs have not been included in this story?

→ The average piece of produce eaten in B.C. has travelled 1400 kilometres. Transportation burns fuel, a non-renewable resource, and creates CO₂, which adds to the greenhouse effect. As much as 50% of the trash that Canadians produce comes from packaging.

→ Buying food has an ecological, social, and economic impact. This is our 'ecological footprint'. Shopping sustainably will lessen our ecological impact and reduce our footprint.

→ The vitamin and mineral content of our food is dependent on how and where it is grown - the quality of the soil, when the food is harvested, how it is stored and processed, and how far it is transported.

→ Local produce is often more expensive than imported produce which is farmed, processed, transported, and sold all by the same corporation.

What Are We Paying For?

"This dinner is just delicious. Where did you get all these vegetables?" said Calum.

"Some we grew ourselves," said Marshall as he passed around the salad bowl, "and some we got at the market". He and Alexandra were having dinner with two of their friends, Calum and Mark.

"I can't believe that we can grow so much food on our little balcony," said Alexandra, "and it tastes great. We got the idea from talking to the farmers at the Moss Street Market."

"What's that?" asked Mark as he took another helping.

"It is a farmers market. They have great food, and you get to talk to the farmers themselves when you buy," said Alexandra.

"Now that we shop there and at other alternative trading places we feel good about where our money is going. Plus, we save money growing our own," said Marshall.

"And it tastes great," said Mark, "but what do you mean about where your money is going?"

"Well, we started looking into where the money we spent at the grocery store was going, and we weren't happy about it. One big cost is transportation. Just think of all the pollution transporting food makes," said Alexandra. She picked up the salad bowl for her second helping.

"There were other things we wanted to support with our buying power, like fair wages and safe pesticide use for farmworkers, so we started looking around. In the process of learning more we got started growing vegetables here," said Marshall.

"I could do this at our place; our balcony is about as big as yours" said Calum.

"Yeh, and then you could have us over to your place for dinner," said Alexandra.

"Now that's a great idea."

Consumers Unite!

Through the Seikatsu Club Consumer Co-operative in Japan, families can buy food which has been produced according to rigorous ecological standards. The club was started by a housewife in Tokyo to help 200 women buy 300 bottles of milk.

The Club is a way for its 170,000 members to take action from their homes - to have access to goods cheaply, but with a clean conscience. It is committed to the environment, the empowerment of women, and to improving workers' conditions.

Discussion

Work on the questions first in small groups of 3 to 5, then report back to the whole class.

1. Go back and read the story from page 1. What is it about? Sum it up in one sentence. *This story is about...*
2. What does the title **What Are We Paying For?** refer to? Do you think it is an appropriate title? What could be another one?
3. In this story, Alexandra and Marshall face a common consumer's dilemma - *they want to shop and eat more sustainably, yet usually don't know enough about the food or produce to say for sure what its true environmental or social costs are.* Here are two general guidelines for deciding which produce is more likely to reduce your ecological footprint: i. Which one travelled the least distance? ii. Which one has the least amount of packaging?

What We Can Do...

The following are just some of the things we can do to bring healthy food to our table. Be creative! Buy for health! Read labels, ask questions at stores, buy locally, eat in season, plant your own garden, join food co-ops, shop at farmers' markets...make a 'lighter ecological footprint'. The choice is yours.

Buy BC!

The B.C. government has developed a program called *Buy BC* which makes consumers aware that their food choices can include buying local produce. Look for this logo.



1. Buy local!

Buying locally supports local farmers and economies by providing a market for locally grown produce. This in turn enables farmers to provide consumers with nutritious, preservative-free, field-ripened produce.

How?

Join a food co-op. Buy food boxes directly from farmers. Buy from local supermarkets and corner stores. Join a **Community Shared Agriculture (CSA)** project. (Read more about CSA's in the **Food Security** unit).

2. Ask a Farmer

Buying food straight from the farmer means we can ask questions about how the food was grown, and learn about farming in our community.

How?

Get in contact with local farmers' groups. (See Resources in the Teaching Guide for information on contacting farmers in B.C.).

Buy food at a local farmers' market.

3. Grow Your Own

Even those of us who don't have gardens can use window-sills and balconies to grow vegetables for our salads and improve our air quality at the same time!

How?

Grow in allotment, community, or roof top gardens. Start or join a shared backyard program. Join a project like *Lifecycles*, or *Linking Land with Future Farmers*, through which people who wish to garden or farm are linked with people who have land they are not using.

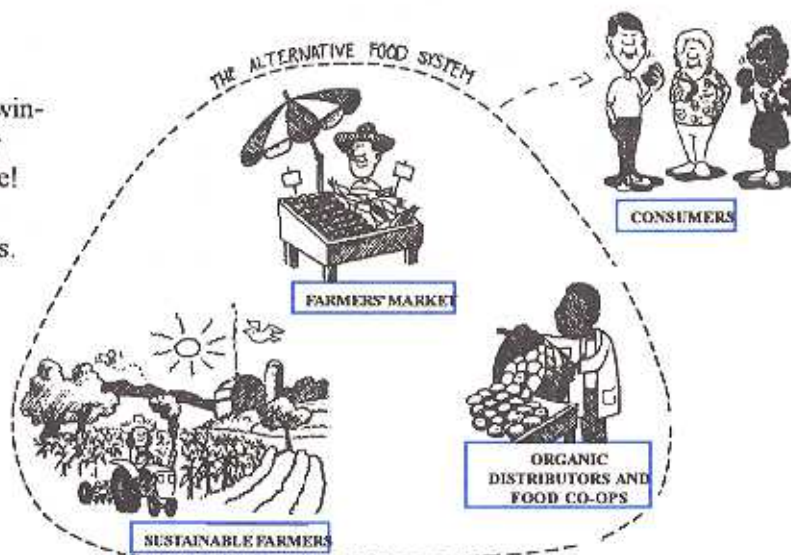
4. Get Involved

Make supporting sustainable food systems your concern.

How?

Work with community kitchens. Ask questions, and make local retailers know of your concerns and requirements.

Join barter networks like **Local Exchange Trading Systems (LETS)**.



Graphic by Tony Biddle

Glossary

Agribusiness - The term agribusiness is really a catch-all. It refers to the present system of modern industrialised agriculture which includes the production and distribution of food. The food business also includes farm financing, machinery, chemicals, seed and feed at the 'input' end and processing, manufacturing and marketing of food at the 'output' end.

Commodities - Goods and articles that can be bought and sold.

Distributors - Companies or businesses which specialize in distributing a product, i.e. in finding wholesalers or retailers to buy the product.

Ecological Footprint - The land and water area that would be indefinitely required to support a particular human population and material standard of living.

Food Security - Food security refers to the right to get enough food at all times, for all people, for an active, healthy life. The essential elements of food security are that nutritious food be available, and that people have the ability to acquire it in a way that is sustainable and restorative to the environment, to society and to the economy.

Handlers - People involved in transporting produce or processed food from one location to another.

LETS - Local Exchange Trading System. LETS is a local bartering system allowing people to trade goods and services, including food, without the exchange of Federal Canadian Dollars. LETS works like a credit union or bank, except that you can only use your account to trade with other people or businesses who have accounts in the LETS system. This way the money and labour stays in the community, employing local people, and creating local businesses.

Nutritious - A nutritious diet provides enough vitamins, proteins, minerals and carbohydrates for a person to lead an active, healthy life.

Processors - People or companies who take farm products and manufacture a food item with it. E.g. jam or juice from fruit, flour from wheat, steak from livestock, frozen pizza from a variety of farm products.

Retailers - People who sell goods directly to consumers for personal or household consumption.

Sustainability - A development concept which takes into account environmental, social and economic factors of human activity. See the Teaching Guide, *Sustainable Agriculture: Sustaining the Land, Sustaining the Farmer*.

Wholesaler - A merchant middleperson who sells chiefly to retailers, other merchants or commercial users mainly for resale or business use.

TeacherGram Sustainable Agriculture Series

- Teaching Guide
- Sharing the Land
- Food Security
- Soil
- Water
- *The Global Consumer*

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